

## CASE STUDY

### Success in employers' numeracy tests

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#### Abstract

Final year students applying for graduate jobs in industry are often required to sit numeracy tests as part of the recruitment process. Students in the College of Arts can be disadvantaged in this area as, often, the last time they will have come across any Mathematics will have been at National 5, GCSE or equivalent level (at the age of 15 or 16). This project was a collaboration between the Mathematics & Statistics support within the Learning Enhancement and Academic Development Service (LEADS) and the Careers Service to create a repository of resources designed to help students refresh their basic mathematical skills and give them the confidence to tackle Employers' Numeracy tests successfully. A Moodle course including videos and tailored learning materials was created to enable students to improve their confidence and ability in relevant mathematical and statistical skills, as well as sample tests (both timed and untimed) to give students an idea of what to expect in a real assessment.

**Keywords:** Numeracy, employability tests, mathematics, statistics.

#### 1. Background

As part of the recruitment process, employers require students to use their mathematical, statistical and problem-solving skills to complete timed tests (Durrani, 2012). Due to their lack of mathematical experience and confidence in this area, final year students from the College of Arts were identified by Maths Support staff in the Learning Enhancement and Academic Development Service (LEADS), as the group demonstrating the greatest need for additional support (Gillespie, 1998).

Following discussions between the Maths Advisers and the Careers Manager, it was felt that the most effective way to support students in this area would be to create and collate relevant mathematical resources, especially as no such resource was currently in existence at the University of Glasgow. The authors were successful in securing a grant from the University Services Innovation Fund, a fund which is available for supporting cross-service initiatives, allowing a collaboration between Maths Support, Media and Careers Service colleagues.

The aim of this project was to deliver a centralised online repository of mathematical resources designed to guide and support students with (re)acquainting themselves with basic numeracy and mathematical skills and give them the confidence to tackle Employers' Numeracy tests successfully.

The resource was piloted with students from the Arts in mind, but with the outcomes of the project being easily transferable, it is intended to offer this resource to students across the university. Further examples of models used to support graduate employability are also presented by Rowlett and Waldock [eds]. (2017), and Pool and Sewell (2007).

#### 2. The Resource

A part-time Research Assistant (RA), recruited for six months, undertook the following tasks: research online numeracy tests (both free and paid), find and collate existing available resources and build a resource for students on the university's VLE, Moodle.

There had been some anecdotal evidence suggesting that freely available tests online were ‘easier’ than ones that were commercially available. The RA spent some time comparing these so that a few sample tests could be created in-house which would bridge the gap between the two.

The resulting resource consists of: lessons on key aspects of numeracy, with specific reference to Percentages, Ratios and Currency Conversions and including examples from this style of testing; practice multiple choice questions and timed tests; links to other online resources; and videos of worked solutions to a selection of numeracy test questions. Most of the resources were created on Moodle itself, using both the Lesson and Test functionalities. The videos, however, were created using a Cintiq Creative Pen Display alongside Camtasia and software which was built in-house. The resulting videos show screenshots of real test questions with the solution written over the top and a voice recording of the explanation of the working as illustrated in Figure 1 below.

### Examples of worked examples in video tutorials

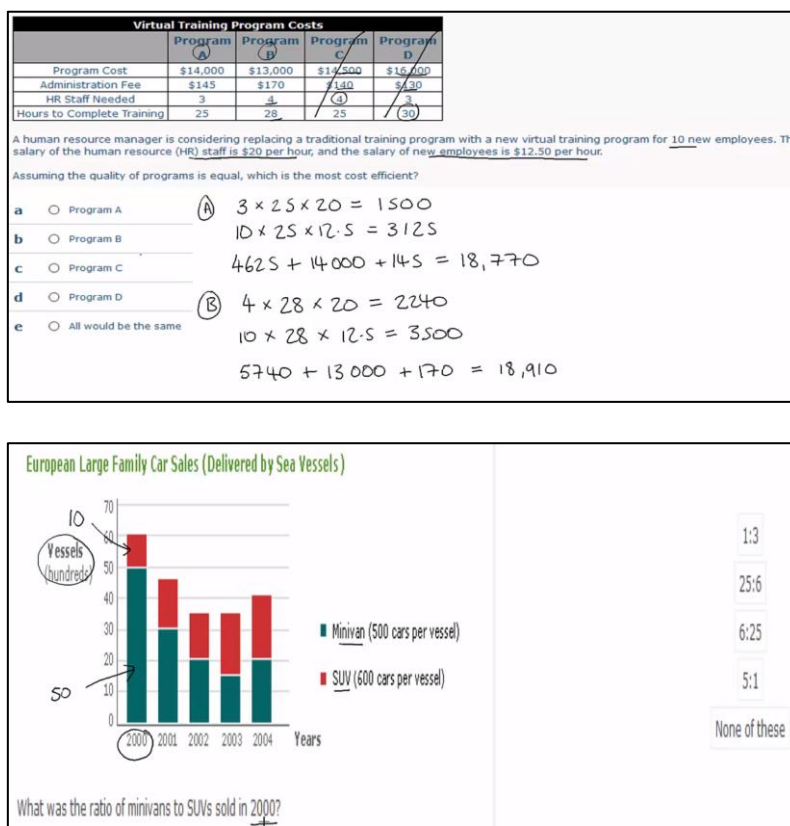


Figure 1: Screenshots of video tutorials

As well as these resources, the Careers Adviser invited some of her contacts in industry to participate in the creation of a video. This gives students an insight into the graduate recruitment process and the place of numeracy testing within it. The video also features the Careers Adviser giving students some tips about applying for graduate jobs and the Maths Advisers introducing themselves and the support available through LEADS.

### 3. Feedback

Initial feedback was obtained from colleagues in both LEADS and Careers, particularly focussed on those from non-numerate backgrounds. Colleagues tried out timed and untimed tests, as well as working through some of the numeracy lessons. The feedback obtained was used to make initial changes to the resources on Moodle.

The resource was then taken to a focus group of students. The focus group was two hours long and involved trying out elements from every aspect of the resource. Six students participated: four from the College of Social Sciences and two from the College of Science and Engineering. There was no uptake from the College of Arts. One student was a postgraduate, the rest were undergraduates at level 3. Interestingly, all the participants had sat a numeracy test before which meant they were able to give informed opinions on the usefulness and relevance of the resource.

The students were asked how they felt about sitting these tests and all admitted to feeling nervous or anxious despite the having some level of numeracy as part of their course at university. The students were then asked to give their views on:

1. The Moodle lessons on Percentages and Ratios – these were found to be ‘useful and well explained’. In particular, they liked the handy techniques such as finding 80% of a quantity when a 20% reduction was required. As the two lessons were found to be so helpful, it was suggested we add a lesson on Currency Conversions;
2. The video tutorials – the students liked these and found it more useful to watch a question being worked out and found these easier to follow compared to reading through a worked solution. It was felt that a short introduction to the question prior to starting the calculation would be helpful. This was a very good suggestion but as it was impractical to record all eighteen videos again, a short textual description of the question featured in the videos were added to the Moodle page featuring the video clips;
3. The practice tests/questions – the participants generally found these reasonable, however several remarked they were surprised at how many of their answers were wrong and were keen to try more to improve their score. The content and level of questions in this resource were found to be comparable to the employers’ tests previously sat by the student;
4. General comments – the students said they would recommend the resource to friends and would use it to help prepare for any further numeracy tests they were required to take in future. They were also interested to hear about the support on offer through LEADS and expressed an interest in attending workshops run by Maths Support staff. When asked about ways this resource could be advertised, suggestions included the use of social media, Careers website and through Schools.

The comprehensive feedback obtained was used to further shape the content on Moodle, most notably by the addition of a new lesson on Currency Conversions. We had hoped to carry out more focus groups, but found it challenging to recruit students to participate due to the time of year.

#### 4. Further plans

The Maths Support team and Careers Service are planning on collaborating to deliver ‘Graduate Numeracy’ workshops throughout the academic year. The workshops will be one hour in length and will cover some key numeracy skills as well as going over some example test questions. Students will also be pointed towards the Moodle resource and further numeracy support available from LEADS.

There are also plans to promote the resource to students through College Employability officers and the Careers Service in general. A regular series of workshops is currently under discussion with one of the Colleges. There is also scope for collaboration with the Alumni Service in the near future.

Further plans include extending the resource further by adding sections on verbal and non-verbal reasoning.

## 5. References

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